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Amendment and Response
Applicant: David Vaughnn
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Title: OPTICAL THROUGHPUT CONDENSER

IN THE CLAIMS

Please amend claims 16, 20, 23, and 27 as follows:

1. – 8.(Cancelled)

9.(Previously Presented) An optical illumination system comprising:

an illuminating source capable of providing light transmissions having a range of angles;

a transmissive substrate positioned in proximity to the illuminating source;

a thin film coating positioned on a surface of the transmissive substrate, the thin film coating having a design property of a distinct cutoff between striking reflected and transmitted light transmissions at a gate angle (Θ_{GATE}) such that light transmissions striking the thin film coating at an angle of incidence less than or equal to the gate angle (Θ_{GATE}) transmits through the thin film, while light transmissions striking the thin film coating at an angle of incidence greater than the gate angle (Θ_{GATE}) reflects back from the thin film; and

an integrating sphere encompassing the thin film coating such that light transmissions reflecting back from the thin film are directed within the integrating sphere and subsequently redirected towards the thin film coating.

10.(Previously Amended) The optical illumination system of claim 9, wherein a final product of light is generated equaling the combination of all light transmission transmitted through the thin film.

11.(Previously Amended) The optical illumination system of claim 9, and further comprising:

a plurality of micro retro reflectors positioned on a portion of an inner surface of the integrating sphere.

12.(Previously Amended) The optical illumination system of claim 11, wherein the plurality of micro retro reflectors are positioned on the portion of the integrating sphere to substantially reverse an incident ray direction of the portion of light transmission reflected back from the thin film.

13.(Original) The optical illumination system of claim 9, wherein the illuminating source is positioned within the integrating sphere.

14.(Previously Amended) The optical illumination system of claim 9, wherein the illuminating source is positioned outside of the integrating sphere and further comprising:

at least one additional illuminating source positioned within the integrating sphere.

15.(Previously Presented) A method of re-concentrating light within an optical illumination system, comprising:

transmitting a series of light transmission from an illuminating source;

directing the series of light transmission towards a thin film positioned on a surface of a transmissive substrate and having a distinct cutoff between striking reflected and transmitted light transmissions at a gate angle (Θ_{GATE}), such that a first portion of the series of light transmissions striking the thin film at an angle of incidence less than or equal to the gate angle (Θ_{GATE}) of the thin film transmits through the thin film and the transmissive

substrate, and a second portion of the series of light transmissions striking the thin film at an angle of incidence greater than the gate angle (Θ_{GATE}) of the thin film reflects back from the thin film;

redirecting the second portion of the series of light transmissions towards the thin film; and

generating a final product of light transmissions equaling all light portions transmitted through the thin film.

16.(Currently Amendment) An apparatus comprising:

an optical source for producing divergent beams;

an integrating sphere for receiving the divergent beams and producing randomly reflected beams; and

a thin film ~~filter~~ coating coupled to a portion of the integrating sphere for receiving a portion of the randomly reflected beams;

wherein the thin film filter is transmissive for beams having incident angles less than a gate angle of the thin film filter and reflective for beams having incident angles greater than the gate angle of the thin film filter.

17.(Previously Presented) The apparatus of claim 16, wherein the optical source is located outside the integrating sphere.

18.(Previously Presented) The apparatus of claim 16, wherein the optical source is located inside the integrating sphere.

19.(Previously Presented) The apparatus of claim 16, wherein the integrating sphere has a highly randomly reflective interior that includes micro retro reflectors.

20.(Currently Amendment) The apparatus of claim 16, wherein the thin film ~~filter~~ coating is formed from dielectric materials.

21.(Previously Presented) The apparatus of claim 16,

wherein an emergent solid angle Ω is defined as 2π x (1-cos [the gate angle]);

wherein an emergent area A is defined as an area of the thin film filter; and

wherein an emergent etendue is defined as A x Ω.

22.(Previously Presented) The apparatus of claim 21,

wherein the optical source has a source etendue; and

wherein the emergent etendue is less than the source etendue.

23.(Currently Amendment) An apparatus, comprising:

an integrating sphere having a randomly reflective wall surrounding an interior space;

an optical source for introducing light beams into the interior space of the integrating sphere; and

a thin film ~~filter~~ coating disposed in an aperture of the wall, the thin film filter being transmissive of light beams having an incident angle less than a gate angle of the thin film filter and being reflected of light beams having incident angles greater than the gate angle of the thin film filter.

24.(Previously Presented) The apparatus of claim 23, wherein the optical source is located outside the integrating sphere.

25.(Previously Presented) The apparatus of claim 23, wherein the optical source is located inside the integrating sphere.

26.(Previously Presented) The apparatus of claim 23, wherein the integrating sphere has a highly randomly reflective interior that includes micro retro reflectors.

27.(Currently Amendment) The apparatus of claim 23, wherein the thin film ~~filter~~ coating is formed from dielectric materials.

28.(Previously Presented) The apparatus of claim 23,

wherein an emergent solid angle Ω is defined as 2π x (1-cos [the gate angle]);

wherein an emergent area A is defined as an area of the thin film filter; and

wherein an emergent etendue is defined as A x Ω.

29.(Previously Presented) The apparatus of claim 28,

wherein the optical source has a source etendue; and

wherein the emergent etendue is less than the source etendue.

30.(Previously Presented) An apparatus, comprising:

an integrating sphere having a highly randomly reflecting interior surface and an output port;

an optical source for introducing light onto the interior surface of the integrating sphere;

a transmissive substrate disposed at the output port of the integrating sphere, having an incident side facing inside of the integrating sphere and an exiting side facing outside the integrating sphere; and

a thin film dielectric coating disposed on the incident side of the transmissive substrate;

wherein the thin film dielectric coating is transmissive for light incident upon the thin film dielectric coating at angles less than a gate angle and reflective

for light incident upon the thin film dielectric coating for incident angles greater than the gate angle;

wherein an emergent solid angle Ω is defined as $2\pi \times$ (1-cos [the gate angle]);

wherein the transmissive substrate has an emergent area A;

wherein an emergent etendue is defined as $A \times \Omega$;

wherein the optical source has a source etendue; and

wherein the emergent etendue is less than the source etendue.